CLAIMS

1. A fluid ejection device comprising:

firing cells;

signal lines configured to receive a series of pulses; and

an address generator configured to receive pulses from the series of pulses and generate a set of address signals in response to the received pulses, wherein the set of address signals is adapted to enable the firing cells for activation.

2. The fluid ejection device of claim 1, wherein the set of address signals is provided during one address timeslot in a series of address timeslots.

3. The fluid ejection device of claim 1, wherein the series of pulses is repeated and the address generator is configured to generate a series of sets of address signals in response to the repeating series of pulses.

4. The fluid ejection device of claim 3, wherein the series of sets of address signals is provided in a corresponding series of address timeslots.

5. The fluid ejection device of claim 3, wherein each set of address signals in the series of sets of address signals is different.

6. The fluid ejection device of claim 1, wherein each signal line of the signal lines is configured to receive a pulse in the series of pulses and the address generator is configured to receive six pulses from the series of pulses.

7. The fluid ejection device of claim 1, wherein pulses in the series of pulses are non-overlapping pulses.

8. The fluid ejection device of claim 1, wherein the address generator comprises:

memory elements configured to provide an active output signal in response to the received pulses; and

logic configured to receive the active output signal and provide active address signals in the set of address signals.

9. The fluid ejection device of claim 8, wherein the memory elements are adapted to provide a series of active output signals in response to the series of pulses.

10. The fluid ejection device of claim 9, wherein the logic receives the series of active output signals and provides a series of sets of address signals in response to the series of active output signals.

11. The fluid ejection device of claim 1, wherein the address generator is configured to provide a sequence of sets of address signals in response to receiving a control pulse coincident with one of the received pulses.

12. A fluid ejection device, comprising:

a first fire line adapted to receive a first energy signal having energy pulses;

a first address generator configured to provide first address signals; and

first resistors electrically coupled to the first fire line and to receive at least some of the first address signals, the first resistors configured to conduct in response to the first energy signal to eject fluid based on the first address signals.

13. The fluid ejection device of claim 12, comprising:

a second fire line adapted to receive a second energy signal having energy pulses;

a second address generator configured to provide second address signals; and

second resistors electrically coupled to the second fire line and to receive the second address signals, the second resistors configured to conduct in response to the second energy signal to eject fluid based on the second address signals.

14. The fluid ejection device of claim 13, wherein the first address generator is configured to generate the first address signals based on timing signals received by the fluid ejection device and the second address generator is configured to generate the second address signals based on the timing signals.

15. The fluid ejection device of claim 14, comprising a control line adapted to receive a control signal having control pulses, wherein each of the control pulses coincide with a pulse of the timing signals to control operation of the first and second address generators.

16. The fluid ejection device of claim 13, wherein the first address generator provides valid first address signals for three of six pulses in a repeating series of six pulses and the second address generator provides valid second address signals for another three of the six pulses in the repeating series of six pulses.

17. The fluid ejection device of claim 16, wherein the valid first address signals and the valid second address signals reference the same address during one cycle through the repeating series of six pulses.

18. The fluid ejection device of claim 12, comprising:

a latch configured to receive first address signals and provide latched address signals based upon the first address signals; and

second resistors configured to eject fluid based on the latched address signals.

20. The fluid ejection device of claim 18, comprising:

a second fire line adapted to receive a second energy signal having energy pulses, wherein the second resistors are electrically coupled to the second fire line and configured to respond to the second energy signal to eject fluid based on the latched address signals.

21. The fluid ejection device of claim 18, comprising signal lines adapted to receive timing signals that provide a repeating series of pulses, wherein each of the signal lines is adapted to receive a different one of a repeating series of pulses.

22. The fluid ejection device of claim 21, comprising a control line adapted to receive a control signal having control pulses that coincide with at least one of the pulses in the repeating series of pulses and to conduct the control pulses to the first address generator.

23. A fluid ejection device comprising:

a plurality of firing cells;

a fire line adapted to receive an energy signal having energy pulses; and

an address generator configured to provide a series of address signals adapted to enable firing cells of the plurality of firing cells in a series of address timeslots, wherein the energy signal provides at least one energy pulse during each of the address timeslots in the series of address timeslots to energize selected enabled firing cells.

24. The fluid ejection device of claim 23, wherein the address generator is configured to provide the series of address signals in a first sequence of the series of address signals and a second sequence of the series of address signals.

25. The fluid ejection device of claim 24, wherein the first sequence of the series of address signals is the reverse of the second sequence of the series of address signals.

26. The fluid ejection device of claim 24, wherein the address generator comprises:

memory elements configured to provide output signals; and

logic configured to receive the output signals and provide the series of address signals in response to the output signals, wherein the logic is configured to provide the series of address signals in the first sequence in response to the memory elements providing the series in a first output sequence and the logic is configured to provide the series of address signals in the second sequence in response to the memory elements providing the output signals in a second output sequence.

27. The fluid ejection device of claim 24, wherein the address generator comprises:

first memory elements configured to provide first output signals;

second memory elements configured to provide second output signals;

first logic configured to receive the first output signals and provide the series of address signals in the first sequence in response to the first output signals; and

second logic configured to receive the second output signals and provide the series of address signals in the second sequence in response to the second output signals.

28. The fluid ejection device of claim 24, wherein the address generator comprises:

memory elements configured to provide output signals;

first logic configured to receive the output signals and provide the series of address signals in the first sequence in response to the output signals; and

second logic configured to receive the output signals and provide the series of address signals in the second sequence in response to the output signals.

29. The fluid ejection device of claim 23, wherein the address generator provides seven address signals as a set of address signals during each of the address timeslots in the series of address timeslots.

30. The fluid ejection device of claim 23, wherein the address generator provides two active address signals in a set of address signals during each of the address timeslots in the series of address timeslots.

31. The fluid ejection device of claim 23, wherein the address generator provides thirteen sets of address signals during thirteen address timeslots in the series of address timeslots.

32. The fluid ejection device of claim 23, wherein the address generator provides fourteen sets of address signals during fourteen address timeslots in the series of address timeslots.

33. The fluid ejection device of claim 23, wherein the address generator comprises:

a shift register configured to provide output signals during each of the address timeslots in the series of address timeslots; and

logic configured to receive the output signals during each address timeslot in the series of address timeslots and provide address signals in the series of address signals during each of the address timeslots in the series of address timeslots in response to the received output signals.

34. The fluid ejection device of claim 33, wherein the logic is configured to actively pull low at least one of the address signals provided during each of the address timeslots in the series of address timeslots.

35. The fluid ejection device of claim 33, wherein the output signals comprise thirteen output signals and the shift register provides a different active output signal in the output signals during each of thirteen address timeslots in the series of address timeslots, and the logic provides different active address signals in response to the different active output signal during each of the thirteen address timeslots in the series of address timeslots.

36. The fluid ejection device of claim 33, wherein the output signals comprise fourteen output signals and the shift register provides a different active output signal in the output signals during each of fourteen address timeslots in the series of address timeslots, and the logic provides different active address signals in response to the different active output signal during each of the fourteen address timeslots in the series of address timeslots.

37. The fluid ejection device of claim 33, further comprising signal lines configured to receive a series of pulses, wherein the logic is configured to receive three pulses in the series of pulses.

38. The fluid ejection device of claim 37, wherein the logic provides valid address signals for three consecutive pulses in the series of pulses.

39. The fluid ejection device of claim 37, wherein the logic provides invalid address signals during three consecutive pulses in the series of pulses.

40. The fluid ejection device of claim 33, comprising signal lines configured to receive a series of pulses, wherein the shift register comprises shift register cells configured to receive an input signal and pulses in the series of pulses and to store the input signal in response to the received pulses.

41. The fluid ejection device of claim 40, wherein each of the shift register cells comprises two stages and each of the two stages is configured to receive two pulses in the series of pulses.

42. The fluid ejection device of claim 40, wherein each of the shift register cells comprises a first stage and a second stage, wherein the first stage is configured to receive the input signal and store an inverse of the input signal in response to two pulses in the series of pulses and the second stage is configured to receive the inverse of the input signal from the first stage and store the input signal in response to another two pulses in the series of pulses.

43. The fluid ejection device of claim 40, wherein each of the shift register cells comprises a first stage and a second stage and the first stage is configured to receive direction signals and the input signal.

44. The fluid ejection device of claim 40, wherein each of the shift register cells comprises a first stage and a second stage and the first stage of one of the shift register cells is configured to receive a control signal as the input signal.

45. The fluid ejection device of claim 40, wherein each of the shift register cells comprises a first stage and a second stage and the first stage of two of the shift register cells is configured to receive a control signal as the input signal.

46. A fluid ejection device comprising:

signal lines that conduct signal pulses; and

means for generating address signals in response to the signal pulses, wherein the address signals are adapted to enable firing cells for activation.

47. The fluid ejection device of claim 46, wherein the means for generating address signals comprises means for generating a series of address signals in a corresponding series of address timeslots.

48. The fluid ejection device of claim 46, wherein the means for generating address signals comprises:

means for providing a series of output signals in response to the signal pulses; and

means for generating address signals based on the series of output signals.

49. The fluid ejection device of claim 48, wherein the means for providing a series of output signals comprises means for providing an active output signal and the means for generating address signals comprises means for providing active address signals based on the active output signal.

50. The fluid ejection device of claim 46, comprising means for initiating the generation of the enable signals.

51. The fluid ejection device of claim 46, comprising:

means for selecting a sequence of the address signals, wherein the means for generating address signals comprises means for generating the selected sequence of the address signals in response to the received signal pulses.

52. A method of enabling firing cells in a fluid ejection device, comprising:

receiving a repeating series of timing signal pulses;

generating a series of address signals in response to the repeating series of timing signal pulses; and

enabling firing cells with the series of address signals.

53. The method of claim 52, comprising:

receiving a first control signal pulse coincident with a first one of the timing signal pulses in the repeating series of timing signal pulses; and

selecting a sequence of address signals for the series of address signals in response to receiving the first control signal pulse.

54. The method of claim 53, comprising:

receiving a second control signal pulse coincident with a second one of the timing signal pulses in the repeating series of timing signal pulses; and

initiating the generation of the series of address signals in response to receiving the second control signal pulse.

55. The method of claim 54, comprising:

providing an active output signal from a memory element in a series of memory elements in response to receiving the second control signal pulse.

56. The method of claim 55, comprising:

providing the active output signal from a different memory element in the series of memory elements in response to each series of timing signal pulses in the repeating series of timing signal pulses.

57. The method of claim 56, comprising:

providing an active address signal in response to the active output signal.

58. The method of claim 52, comprising:

receiving a control signal pulse coincident with one of the timing signal pulses in the repeating series of timing signal pulses; and

initiating the generation of the series of address signals in response to receiving the control signal pulse.

59. The method of claim 52, wherein generating a series of address signals comprises:

generating a set of output signals in response to one series of timing signal pulses in the repeating series of timing signal pulses; and

providing a set of address signals in the series of address signals based on the set of output signals.

60. The method of claim 52, wherein generating a series of address signals comprises:

generating an active output signal in response to one series of timing signal pulses in the repeating series of timing signal pulses; and

providing two active address signals in response to the active output signal.

61. The method of claim 52, wherein generating a series of address signals comprises:

generating an active output signal in a series of active output signals in response to each of the series of timing signal pulses in the repeating series of timing signal pulses; and

providing active address signals in a series of active address signals in response to each of the active output signals in the series of active output signals.

62. A printhead die comprising:

a controller configured to generate a set of signals;

a first line adapted to conduct first pulses;

a second line adapted to conduct second pulses;

a first group of resistors coupled to conduct based upon the set of signals and the first pulses; and

a second group of resistors coupled to conduct based upon the set of signals and the second pulses.

63. The printhead die of claim 62, wherein the first group of resistors conducts in response to a first at least two signals of the set of signals and the second group of resistors conducts based upon a second at least two signals of the set of signals, and wherein the first at least two signals and the second at least two signals each comprise at least one different signal then the other.

64. The printhead die of claim 62, wherein the controller provides the set of signals in a predetermined pattern.

65, The printhead die of claim 64, wherein the predetermined pattern comprises sequentially providing at least two signals of the set of signals during any time period.

66. The printhead die of claim 65, wherein the time period during which each group of at least two signals is provided has a same duration.

67. The printhead die of claim 62, wherein the controller comprises:

a shift register including a plurality of shift register cells, each configured to provide at least one output signal;

a plurality of outputs each configured provide one of the set of signals; and

a plurality of switches configured so that at least two switches of the plurality of switches is coupled to receive an output of one shift register cells and wherein one of the plurality of switches is coupled to one of the plurality of outputs.

68. The printhead die of claim 62, wherein the controller comprises:

a shift register configured to provide output signals; and

logic configured to receive the output signals and provide the series of signals in response to the output signals.

69. The printhead die of claim 62, wherein the set of signals includes at least a first state and a second state, and wherein when the set of signals are in the first state only the first group of resistors are coupled to conduct and when the set of signal are in the second state only the second group of resistors are coupled to conduct.

70. The printhead die of claim 62, wherein the set of signals comprises a plurality of states and wherein the states are provided in a sequence as the set of signals by the controller.

71. The printhead die of claim 70, wherein the set of signals are provided in a second sequence that is an inverse of the sequence, based upon a direction signal received by the controller.

72. A fluid ejection device comprising:

firing cells;

a control line configured to receive a control signal; and

a controller configured to respond to the control signal to initiate a sequence adapted to enable the firing cells for activation.

73. The fluid ejection device of claim 72, comprising signal lines configured to receive pulses, wherein the control signal comprises control pulses and the controller is configured to initiate the sequence in response to receiving one of the control pulses coincident with one of the pulses.

74. The fluid ejection device of claim 73, wherein the controller comprises an address generator configured to receive the control pulses and the pulses and provide a series of address signals in response to receiving the one of the control pulses coincident with the one of the pulses.

75. The fluid ejection device of claim 73, wherein the controller comprises memory elements configured to provide a series of active output signals in response to receiving the one of the control pulses coincident with the one of the pulses.

76. The fluid ejection device of claim 73, wherein the controller comprises a shift register configured to provide a series of active output signals in response to receiving the one of the control pulses coincident with the one of the pulses.

77. The fluid ejection device of claim 76, wherein the signal lines are configured to receive the pulses in a series of pulses and the shift register is configured to shift once in response to receiving the series of pulses.

78. The fluid ejection device of claim 72, comprising signal lines configured to receive pulses in a series of pulses, wherein the control signal comprises control pulses and the controller is configured to initiate the sequence in response to receiving one of the control pulses coincident with a particular pulse in the series of pulses.

79. The fluid ejection device of claim 72, comprising signal lines configured to receive pulses, wherein the control signal comprises control pulses and the controller is configured to provide a sequence order for the sequence in response to receiving one of the control pulses coincident with one of the pulses.

80. The fluid ejection device of claim 72, comprising signal lines configured to receive pulses in a series of pulses, wherein the control signal comprises control pulses and the controller is configured to provide the sequence in a first sequence order in response to receiving one of the control pulses coincident with a first one of the pulses in the series of pulses and a second sequence order in response to receiving one of the control pulses coincident with a second one of the pulses in the series of pulses.

81. The fluid ejection device of claim 80, comprising signal lines configured to receive pulses, wherein the control signal comprises control pulses and the controller is configured to select a sequence order for the sequence in response to receiving a first control pulse coincident with a first pulse and initiate the sequence in response to receiving a second control pulse coincident with a second pulse.

82. The fluid ejection device of claim 81, wherein the controller is configured to prevent the firing cells from being enabled for activation in response to receiving the first control pulse coincident with the first pulse and a third control pulse coincident with a third pulse.

83. The fluid ejection device of claim 72, wherein the controller is configured to respond to the control signal to prevent the firing cells from being enabled for activation.

84. The fluid ejection device of claim 72, wherein the controller is configured to respond to the control signal to stop the sequence after the sequence is initiated.

85. A fluid ejection device comprising:

first firing cells;

a control line configured to receive a control signal; and

a first address generator configured to respond to the control signal to initiate a sequence of first address signals adapted to enable the first firing cells for activation.

86. The fluid ejection device of claim 85, comprising:

second firing cells; and

a second address generator configured to respond to the control signal to initiate a sequence of second address signals adapted to enable the second firing cells for activation.

87. The fluid ejection device of claim 85, comprising signal lines adapted to receive pulses, wherein the control signal comprises control pulses and the first address generator is configured to initiate the sequence of first address signals in response to receiving a first control pulse coincident with a first pulse and the second address generator is configured to initiate the sequence of second

address signals in response to receiving a second control pulse coincident with a second pulse.

88. A fluid ejection device comprising:

firing cells;

a control line configured to receive a control signal; and

a controller configured to respond to the control signal to prevent the firing cells from being enabled for activation.

89. The fluid ejection device of claim 88, comprising signal lines adapted to receive pulses, wherein the control signal comprises control pulses and the controller is configured to prevent the firing cells from being activated in response to receiving a first control pulse coincident with a first pulse and a second control pulse coincident with a second pulse.

90. The fluid ejection device of claim 88, comprising signal lines adapted to receive pulses, wherein the control signal comprises control pulses and the controller is configured to prevent the firing cells from being activated in response to receiving a low control signal coincident with a first pulse.

91. The fluid ejection device of claim 88, wherein the controller is configured to respond to the control signal to initiate a sequence adapted to enable the firing cells for activation and to stop the sequence to prevent the firing cells from being enabled for activation.

92. A fluid ejection device comprising:

first firing cells;

a control line configured to receive a control signal; and

a first address generator configured to respond to the control signal to provide first address signals that prevent the first firing cells from being enabled for activation.

93. A fluid ejection device comprising:

means for ejecting fluid;

means for receiving a control signal; and

means for responding to the control signal to initiate a sequence adapted to enable the means for ejecting fluid for activation.

94. A fluid ejection device comprising:

means for ejecting fluid;

means for receiving a control signal; and

means for responding to the control signal to prevent the means for ejecting fluid from being enabled for activation.

95. A method for ejecting fluid from a fluid ejection device, the method comprising:

receiving a control signal; and

initiating a sequence adapted to enable firing cells in response to the control signal.

96. A method for preventing ejection of fluid from a fluid ejection device, the method comprising:

receiving a control signal; and

disabling firing cells for activation based on the control signal.